

DOCKET NUMBER: CH920000087US1

1 **REMARKS**

2 These remarks follow the order of the paragraphs of the office action. Relevant portions of the
3 office action are shown indented and italicized.

4 **DETAILED ACTION**

5 1. *The specification is objected to for the following reasons:*

6 *Page 6 of the specification, line 15 refers to the information bits of figure*
7 *1 as 80, when they should correctly be referred to as 90.*

8 In response, applicants respectfully state that *the specification was so corrected on Page 7.*

9 *Throughout the specification the acronym QAM is used (see p. 6, lines 3,*
10 *18, p. 7, line 1, p. 8, line 16, etc.) without first a definition of this acronym. For*
11 *example, in the first instance on p. 6 line 3, the full term followed by the*
12 *acronym, Quadrature Amplitude Modulation (QAM), should be used. The*
13 *recitation, "constellation (Le., b is even)" (p. 8, line 17) is unclear as the term b*
14 *has not yet been defined in the specification.*

15 In response, applicants respectfully state that the specification was so corrected on Pages 6
16 and 8.

17 **Claim Objections**

18 2. *Claims 2, 9 are objected to because of the following informalities: the use*
19 *of the acronym LOPC. The acronym LOPC should be correctly defined as*
20 *low-density parity check. Appropriate correction is required.*

21 **Claim Rejections - 35 USC § 103**

22 3. *The following is a quotation of 35 U.S.C. 1 03(a) which forms the basis for*
23 *all obviousness rejections set forth in this Office action:*

DOCKET NUMBER: CH920000087US1

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 1, 2, 8, 9 and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ungerboeck and in further view of Cooklev.

Claims 1, 2, 8, 9, Ungerboeck discloses a multilevel channel coding technique is described which improves error performance of synchronous data links (abstract). Although Ungerboeck does not specifically use the term transmitter, the movement of data between data links, whether wireless or wired, some sort of transmitter is implied. In figure 4, Ungerboeck discloses a method of dividing a data set A_0 into a first subset 8_0 and a second subset 8_1 . Each of the subsets are given short block code words to state the transitions of the structure (p. 57, III). Gray coding is used as a mapping function (p. 58, col. 1 J paragraph 2). Ungerboeck fails to disclose the selecting of a symbol from within the subsets of encoded data, however, Cooklev discloses a new encoding method which builds upon the Trellis Coded Modulation (TCM) technique introduced by Ungerboeck for maximizing coding gains. This new design uses low density parity-check (LDPC) coding as an encoding scheme. In figure 2, Cooklev discloses an encoder which input bits are divided into a first and second group. The first group is block encoded by FEC Encoder I and the second group of bits is block encoded by FEC Encoder II. The resulting block codes output from FEC encoders I and II are input to a coset selector which selects a subset of the signal constellation (p. 1, paragraph 2). The coset selector of figure 1 chooses a coset, or subset, inputs a subset into the signal point selector to select a code symbol for transmission. Cooklev discloses a motivation to replace TCM encoding with LDPC codes because LDPC codes are shown to have better performance when compared to convolutional codes. Therefore it would be obvious to one skilled in the art at the time of invention to incorporate Cooklev's disclosure into Ungerboeck's teaching. Claim 15, inherits the limitations of Claim 8, further, the limitation of being connected to the information source for transmitting the set of the information bits is inherent in a transmitting device. Cooklev discloses input bits input the encoders, and it must be assumed that an information source of some sort is supplying the information bits of the input. 5. Claims 16-18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ungerboeck and Cooklev and in further

DOCKET NUMBER: CH920000087US1

1 *view of Morelos-Zaragoza et al. Claims 16-18, inherit the limitations of Claims 1 and*
2 *8 respectively, neither Ungerboeck nor Cooklev disclose a program executable*
3 *machine implantation of their inventions. However, Morelos-Zaragoza discloses*
4 *a method and apparatus for multi-level encoding in which the components,*
5 *processes, and/or data structures are implemented using computer software.*
6 *Different implementations may be used and may include other types of*
7 *programming languages, computing platforms, computer programs, firmware, and/or*
8 *machines (col. 6, lines 16-22). The use of executable program or software*
9 *implementations of coding methodologies is common in the art because of the*
10 *computationally efficient nature of these implementations and would therefore be*
11 *obvious to one skilled in the art at the time of invention to incorporate software*
12 *implementation of the encoding and transmission of Ungerboeck and Cooklev's*
13 *combined apparatus.*

14 In response, applicants respectfully state that the 103 obviousness rejection based on the cited art
15 is traversed. There appears to be no other reason to combine Ungerboeck and Cooklev except in
16 the use of hindsight to allegedly construct the elements of the claims in the present action. The
17 MPEP and the courts have clearly stated that this is not allowed. Even when combined these
18 apparently do not anticipate or make obvious the invention in claims 1-27. The Examiner is
19 requested to show basis for the obviousness statements.

20 However in order to bring the application to quick allowance, the elements of the objected to
21 [allowed] claims are included in each independent claim. The limitation of claim 3 is included in
22 claim 1. The limitation of claim 13 is included in claim 8. Thus except for the canceled claims 3
23 and 13, all claims are allowable even over the alleged prior art.

24 *Claim Objections*

25 *6. Claim 10 is objected to because of the following informalities: The*
26 *recitation, "A method as claimed in Claim 8", however, Claim 8 is an apparatus*
27 *claim and the claim should be changed to An apparatus as claimed in Claim 8.*
28 *Appropriate correction is required.*

29 In response, applicants respectfully state that *claim 10 is so amended.*

DOCKET NUMBER: CH920000087US1

7. Claims 3-7, 11-14 are objected to as they depend upon rejected claims, but would be allowable if rewritten in independent form.

Applicant expresses appreciation of the allowance of claims 3-7 and 11-14.

In response, applicants respectfully state that the limitation of claim 3 is included in claim 1. The limitation of claim 13 is included in claim 8. Thus all claims 1-7, 9-12 and 14-18 are allowable, even when considering the cited art.

Although applicant do not agree that the invention in claims 1 and 8 is obvious from the cited art, in order to advance the prosecution of this application, the limitation of objected-to claim 8 is included in claim 1. The limitation of objected-to claim 13 is included in claim 8.

It is anticipated that this amendment brings the application to allowance of claims 1-7, 9-12 and 14-18. Favorable action is respectfully solicited. In the unlikely event that any claim remains rejected, please contact the undersigned by phone in order to discuss the application.

Please charge any fee necessary to enter this paper to deposit account 50-0510.

Respectfully submitted,

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